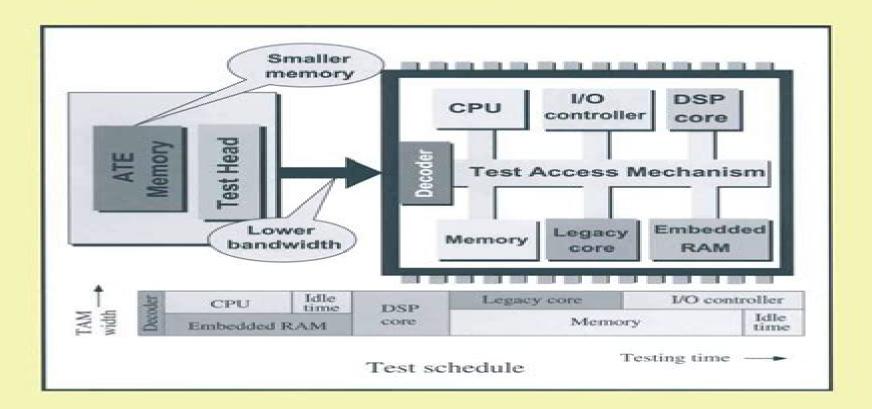
# Test Resource Partitioning for System-on-a-Chip

Krishnendu Chakrabarty Vikram Iyengar Anshuman Chandra



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# **Test Resource Partitioning For Systemonachip**

Keith B. Schaub, Joe Kelly

#### **Test Resource Partitioning For Systemonachip:**

Test Resource Partitioning for System-on-a-Chip Krishnendu Chakrabarty, Vikram Iyengar, Anshuman Chandra, 2002-06-30 Test Resource Partitioning for System on a Chip is about test resource partitioning and optimization techniques for plug and play system on a chip SOC test automation Plug and play refers to the paradigm in which core to core interfaces as well as core to SOC logic interfaces are standardized such that cores can be easily plugged into virtual sockets on the SOC design and core tests can be plugged into the SOC during test without substantial effort on the part of the system integrator The goal of the book is to position test resource partitioning in the context of SOC test automation as well as to generate interest and motivate research on this important topic SOC integrated circuits composed of embedded cores are now commonplace Nevertheless There remain several roadblocks to rapid and efficient system integration Test development is seen as a major bottleneck in SOC design and test challenges are a major contributor to the widening gap between design capability and manufacturing capacity Testing SOCs is especially challenging in the absence of standardized test structures test automation tools and test protocols Test Resource Partitioning for System on a Chip responds to a pressing need for a structured methodology for SOC test automation It presents new techniques for the partitioning and optimization of the three major SOC test resources test hardware testing time and test data volume Test Resource Partitioning for System on a Chip paves the way for a powerful integrated framework to automate the test flow for a large number of cores in an SOC in a plug and play fashion The framework presented allows the system integrator to reduce test cost and meet short time to market Test Resource Partitioning for System-on-a-Chip Vikram Iyengar, Anshuman Chandra, 2012-12-06 Test requirements Resource Partitioning for System on a Chip is about test resource partitioning and optimization techniques for plug and play system on a chip SOC test automation Plug and play refers to the paradigm in which core to core interfaces as well as core to SOC logic interfaces are standardized such that cores can be easily plugged into virtual sockets on the SOC design and core tests can be plugged into the SOC during test without substantial effort on the part of the system integrator The goal of the book is to position test resource partitioning in the context of SOC test automation as well as to generate interest and motivate research on this important topic SOC integrated circuits composed of embedded cores are now commonplace Nevertheless There remain several roadblocks to rapid and efficient system integration Test development is seen as a major bottleneck in SOC design and test challenges are a major contributor to the widening gap between design capability and manufacturing capacity Testing SOCs is especially challenging in the absence of standardized test structures test automation tools and test protocols Test Resource Partitioning for System on a Chip responds to a pressing need for a structured methodology for SOC test automation It presents new techniques for the partitioning and optimization of the three major SOC test resources test hardware testing time and test data volume Test Resource Partitioning for System on a Chip paves the way for a powerful integrated framework to automate the test flow for a large number of cores in an SOC in a plug and

play fashion The framework presented allows the system integrator to reduce test cost and meet short time to market SOC (System-on-a-Chip) Testing for Plug and Play Test Automation Krishnendu Chakrabarty, 2013-04-17 System on a Chip SOC integrated circuits composed of embedded cores are now commonplace Nevertheless there remain several roadblocks to rapid and efficient system integration Test development is seen as a major bottleneck in SOC design and manufacturing capabilities Testing SOCs is especially challenging in the absence of standardized test structures test automation tools and test protocols In addition long interconnects high density and high speed designs lead to new types of faults involving crosstalk and signal integrity SOC System on a Chip Testing for Plug and Play Test Automation is an edited work containing thirteen contributions that address various aspects of SOC testing SOC System on a Chip Testing for Plug and Play Test Automation is a valuable reference for researchers and students interested in various aspects of SOC testing **System-on-Chip** Bashir M. Al-Hashimi, 2006-01-31 This book highlights both the key achievements of electronic systems design targeting SoC implementation style and the future challenges presented by the Introduction to Advanced System-on-Chip Test Design and Optimization Erik continuing scaling of CMOS technology Larsson, 2006-03-30 SOC test design and its optimization is the topic of Introduction to Advanced System on Chip Test Design and Optimization It gives an introduction to testing describes the problems related to SOC testing discusses the modeling granularity and the implementation into EDA electronic design automation tools The book is divided into three sections i test concepts ii SOC design for test and iii SOC test applications The first part covers an introduction into test problems including faults fault types design flow design for test techniques such as scan testing and Boundary Scan The second part of the book discusses SOC related problems such as system modeling test conflicts power consumption test access mechanism design test scheduling and defect oriented scheduling Finally the third part focuses on SOC applications such as integrated test scheduling and TAM design defect oriented scheduling and integrating test design with the core selection process

Advances in VLSI and Embedded Systems Zuber Patel, Shilpi Gupta, Nithin Kumar Y. B., 2020-08-28 This book presents select peer reviewed proceedings of the International Conference on Advances in VLSI and Embedded Systems AVES 2019 held at SVNIT Surat Gujarat India The book covers cutting edge original research in VLSI design devices and emerging technologies embedded systems and CAD for VLSI With an aim to address the demand for complex and high functionality systems as well as portable consumer electronics the contents focus on basic concepts of circuit and systems design fabrication testing and standardization This book can be useful for students researchers as well as industry professionals interested in emerging trends in VLSI and embedded systems

System-Level Validation Mingsong Chen, Xiaoke
Qin, Heon-Mo Koo, Prabhat Mishra, 2012-09-19 This book covers state of the art techniques for high level modeling and validation of complex hardware software systems including those with multicore architectures Readers will learn to avoid time consuming and error prone validation from the comprehensive coverage of system level validation including high level

modeling of designs and faults automated generation of directed tests and efficient validation methodology using directed tests and assertions The methodologies described in this book will help designers to improve the quality of their validation performing as much validation as possible in the early stages of the design while reducing the overall validation effort and Design and Test Technology for Dependable Systems-on-Chip Ubar, Raimund, Raik, Jaan, Vierhaus, Heinrich cost Theodor, 2010-12-31 This book covers aspects of system design and efficient modelling and also introduces various fault models and fault mechanisms associated with digital circuits integrated into System on Chip SoC Multi Processor System on Chip MPSoC or Network on Chip NoC VLSI-SoC: Advanced Topics on Systems on a Chip Ricardo Reis, Vincent Mooney, Paul Hasler, 2009-04-05 This book contains extended and revised versions of the best papers that were presented during the fifteenth edition of the IFIP IEEE WG10 5 International Conference on Very Large Scale Integration a global System on a Chip Design CAD conference The 15th conference was held at the Georgia Institute of Technology Atlanta USA October 15 17 2007 Previous conferences have taken place in Edinburgh Trondheim Vancouver Munich Grenoble Tokyo Gramado Lisbon Montpellier Darmstadt Perth and Nice The purpose of this conference sponsored by IFIP TC 10 Working Group 10 5 and by the IEEE Council on Electronic Design Automation CEDA is to provide a forum to exchange ideas and show industrial and academic research results in the field of microelectronics design The current trend toward increasing chip integration and technology process advancements brings about stimulating new challenges both at the physical and system design levels as well in the test of these systems VLSI SoC conferences aim to address these exciting new issues

Power-Aware Testing and Test Strategies for Low Power Devices Patrick Girard, Nicola Nicolici, Xiaoging Wen, 2010-03-11 Managing the power consumption of circuits and systems is now considered one of the most important challenges for the semiconductor industry Elaborate power management strategies such as dynamic voltage scaling clock gating or power gating techniques are used today to control the power dissipation during functional operation. The usage of these strategies has various implications on manufacturing test and power aware test is therefore increasingly becoming a major consideration during design for test and test preparation for low power devices This book explores existing solutions for power aware test and design for test of conventional circuits and systems and surveys test strategies and EDA solutions for testing low power devices Production Testing of RF and System-on-a-chip Devices for Wireless Communications Keith B. Schaub, Joe Kelly, 2004 Technological advances have created a need for the merger and rethinking of past testing approaches for wireless equipment This first of its kind resource offers professionals an in depth overview of cutting edge RF radio frequency and SOC system on a chip product testing for wireless communications System-on-Chip Test Architectures Laung-Terng Wang, Charles E. Stroud, Nur A. Touba, 2010-07-28 Modern electronics testing has a legacy of more than 40 years The introduction of new technologies especially nanometer technologies with 90nm or smaller geometry has allowed the semiconductor industry to keep pace with the increased performance capacity demands from consumers As a result semiconductor test costs have been growing steadily and typically amount to 40% of today s overall product cost This book is a comprehensive guide to new VLSI Testing and Design for Testability techniques that will allow students researchers DFT practitioners and VLSI designers to master quickly System on Chip Test architectures for test debug and diagnosis of digital memory and analog mixed signal designs Emphasizes VLSI Test principles and Design for Testability architectures with numerous illustrations examples Most up to date coverage available including Fault Tolerance Low Power Testing Defect and Error Tolerance Network on Chip NOC Testing Software Based Self Testing FPGA Testing MEMS Testing and System In Package SIP Testing which are not yet available in any testing book Covers the entire spectrum of VLSI testing and DFT architectures from digital and analog to memory circuits and fault diagnosis and self repair from digital to memory circuits Discusses future nanotechnology test trends and challenges facing the nanometer design era promising nanotechnology test techniques including Quantum Dots Cellular Automata Carbon Nanotubes and Hybrid Semiconductor Nanowire Molecular Computing Practical problems at the end of each chapter for students **Embedded Processor-Based** Self-Test Dimitris Gizopoulos, A. Paschalis, Yervant Zorian, 2013-03-09 Embedded Processor Based Self Test is a guide to self testing strategies for embedded processors Embedded processors are regularly used today in most System on Chips SoCs Testing of microprocessors and embedded processors has always been a challenge because most traditional testing techniques fail when applied to them This is due to the complex sequential structure of processor architectures which consists of high performance datapath units and sophisticated control logic for performance optimization Structured Design for Testability DfT and hardware based self testing techniques which usually have a non trivial impact on a circuit s performance size and power can not be applied without serious consideration and careful incorporation into the processor design Embedded Processor Based Self Test shows how the powerful embedded functionality that processors offer can be utilized as a self testing resource Through a discussion of different strategies the book emphasizes on the emerging area of Software Based Self Testing SBST SBST is based on the idea of execution of embedded software programs to perform self testing of the processor itself and its surrounding blocks in the SoC SBST is a low cost strategy in terms of overhead area speed power development effort and test application cost as it is applied using low cost low speed test equipment Embedded Processor Based Self Test can be used by designers DfT engineers test practitioners researchers and students working on digital testing and in particular processor and SoC test This book sets the framework for comparisons among different SBST methodologies by discussing key requirements It presents successful applications of SBST to a number of embedded processors of different complexities and instruction set architectures **Urban Intelligence and Applications** Xiaohui Yuan, Mohamed Elhoseny, 2020-06-25 This volume presents selected papers from the International Conference on Urban Intelligence and Applications ICUIA which took place on May 10 12 2019 in Wuhan China The goal of the conference was to bring together researchers industry leaders policy makers and administrators to discuss emerging technologies and their

applications to advance the design and implementation of intelligent utilization and management of urban assets and thus contributing to the autonomous reliable and efficient operation of modern smart cities. The papers are collated to address major themes of urban sustainability urban infrastructure and management smart city applications image and signal processing natural language processing and machine learning for monitoring and communications applications. The book will be of interest to researchers and industrial practitioners working on geospatial theories and tools smart city applications urban mobility and transportation and community well being and management Fault Injection Techniques and Tools for Embedded Systems Reliability Evaluation Alfredo Benso, Paolo Prinetto, 2005-12-15 Fault Injection Techniques and Tools for Embedded Systems Reliability Evaluation intends to be a comprehensive guide to Fault Injection techniques used to evaluate the dependability of a digital system The description and the critical analysis of different Fault Injection techniques and tools will be authored by key scientists in the field of system dependability and fault tolerance The Core Test Wrapper Handbook Francisco da Silva, Teresa McLaurin, Tom Waayers, 2006-09-15 In the early to mid 1990 s while working at what was then Motorola Se conductor business changes forced my multi hundred dollar microprocessor to become a tens of dollars embedded core I ran into first hand the problem of trying to deliver what used to be a whole chip with something on the order of over 400 interconnect signals to a design team that was going to stuff it into a package with less than 220 signal pins and surround it with other logic I also ran into the problem of delivering microprocessor specification verifition a microprocessor is not just about the functions and instructions included with the instruction set but also the MIPs rating at some given f quency I faced two dilemmas one I could not deliver functional vectors without significant development of off core logic to deal with the reduced chip I O map and everybody s I O map was going to be a little different and two the JTAG 1149 1 boundary scan ring that was around my core when it was a chip was going to be woefully inadequate since it did not support speed signal application and capture and independent use separate from my core I considered the problem at length and came up with my own solution that was predominantly a separate non JTAG scan test wrapper that supported at speed application of launch capture cycles using the system clock But my problems weren t over at that point either

Oscillation-Based Test in Mixed-Signal Circuits Gloria Huertas Sánchez, Diego Vázquez García de la Vega, Adoración Rueda Rueda, Jose Luis Huertas Díaz, 2007-06-03 Oscillation Based Test in Mixed Signal Circuits presents the development and experimental validation of the structural test strategy called Oscillation Based Test OBT in short The results here presented allow to assert not only from a theoretical point of view but also based on a wide experimental support that OBT is an efficient defect oriented test solution complementing the existing functional test techniques for mixed signal circuits

**Testing Static Random Access Memories** Said Hamdioui,2013-06-29 Testing Static Random Access Memories covers testing of one of the important semiconductor memories types it addresses testing of static random access memories SRAMs both single port and multi port It contributes to the technical acknowledge needed by those involved in memory testing

engineers and researchers The book begins with outlining the most popular SRAMs architectures Then the description of realistic fault models based on defect injection and SPICE simulation are introduced Thereafter high quality and low cost test patterns as well as test strategies for single port two port and any p port SRAMs are presented together with some preliminary test results showing the importance of the new tests in reducing DPM level The impact of the port restrictions e g read only ports on the fault models tests and test strategies is also discussed Features Fault primitive based analysis of memory faults A complete framework of and classification memory faults A systematic way to develop optimal and high quality memory test algorithms A systematic way to develop test patterns for any multi port SRAM Challenges and trends in embedded memory testing Advances in Electronic Testing Dimitris Gizopoulos, 2006-01-22 Advances in Electronic Testing Challenges and Methodologies is a new type of edited volume in the Frontiers in Electronic Testing book series devoted to recent advances in electronic circuits testing The book is a comprehensive elaboration on important topics which capture major research and development efforts today The motivation and inspiration behind this book is to deliver a thorough text that focuses on the evolution of test technology provides insight about the abiding importance of discussed topics records today s state of the art and industrial practices and trends reveals the challenges for emerging testing methodologies and envisages the future of this journey The book consists of eleven edited chapters written by experts in Defect Oriented Testing Nanometer Technologies Failures and Testing Silicon Debug Delay Testing High Speed Test Interfaces DFT Oriented Low Cost Testers Embedded Cores and System on Chip Testing Memory Testing Mixed Signal Testing RF Testing and Loaded Board Testing Contributing authors are affiliated with in alphabetical order Agilent ARM Balearic Islands Univ IBM Inovys Intel Logic Vision Magma Mentor Graphics New Mexico Univ Sandia National Labs Synopsys Teradyne and Texas Instruments Advances in Electronic Testing Challenges and Methodologies is an advanced textbook and reference point for senior undergraduate and graduate students in MSc or PhD tracks professors and research leaders in the electronic testing domain It is also for industry design and test engineers and managers seeking a global view and understanding of test technology practices and methodologies and a dense elaboration on test related issues they face in their development projects There is a definite need for documenting the advances in testing I find the work of this edited volume by Dimitris Gizopoulos and his team of authors to be significant and timely the book provides besides novel test methodologies a collective insight into the emerging aspects of testing This I think is beneficial to practicing engineers and researchers both of whom must stay at the forefront of technology This latest addition to the Frontiers Series is destined to serve an important role From the Foreword by Vishwani D Agrawal Consulting Editor Frontiers in Electronic Testing Book Series High **Performance Memory Testing** R. Dean Adams, 2005-12-29 Are memory applications more critical than they have been in the past Yes but even more critical is the number of designs and the sheer number of bits on each design It is assured that catastrophes which were avoided in the past because memories were small will easily occur if the design and test engineers

do not do their jobs very carefully High Performance Memory Testing Design Principles Fault Modeling and Self Test is based on the author s 20 years of experience in memory design memory reliability development and memory self test High Performance Memory Testing Design Principles Fault Modeling and Self Test is written for the professional and the researcher to help them understand the memories that are being tested

#### Reviewing **Test Resource Partitioning For Systemonachip**: Unlocking the Spellbinding Force of Linguistics

In a fast-paced world fueled by information and interconnectivity, the spellbinding force of linguistics has acquired newfound prominence. Its capacity to evoke emotions, stimulate contemplation, and stimulate metamorphosis is really astonishing. Within the pages of "**Test Resource Partitioning For Systemonachip**," an enthralling opus penned by a highly acclaimed wordsmith, readers set about an immersive expedition to unravel the intricate significance of language and its indelible imprint on our lives. Throughout this assessment, we shall delve in to the book is central motifs, appraise its distinctive narrative style, and gauge its overarching influence on the minds of its readers.

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